Team Science and Collaboration

L. Michelle Bennett, PhD

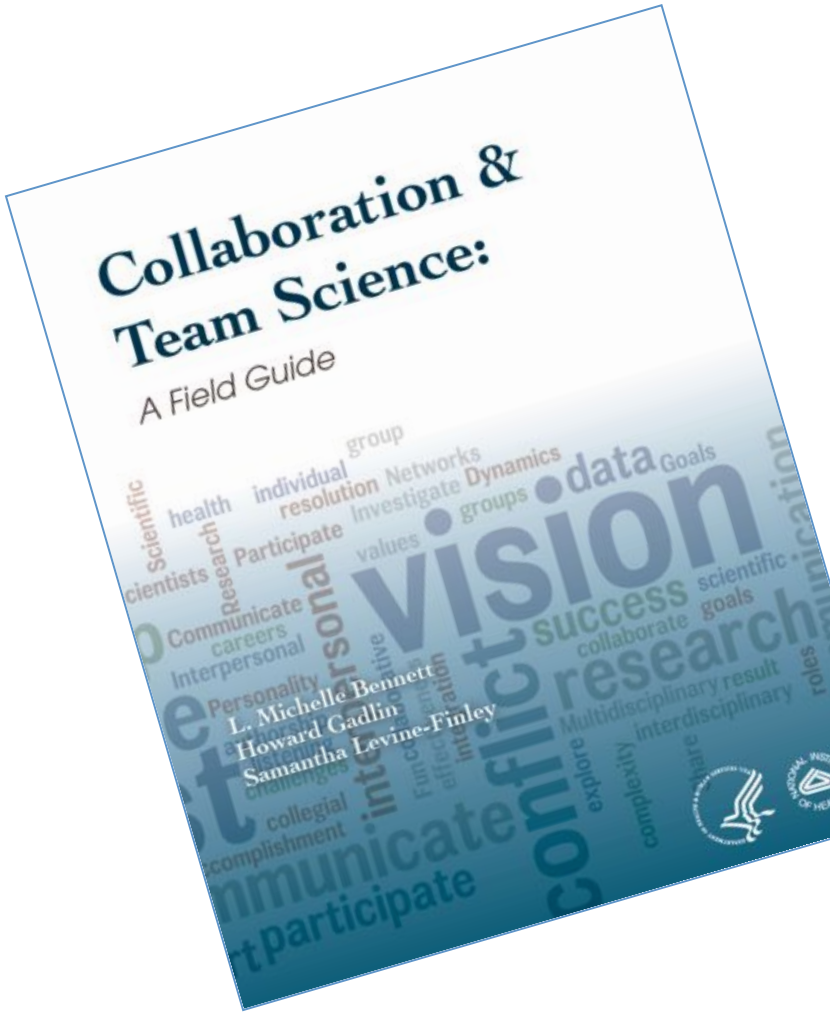
Deputy Scientific Director, NHLBI, NIH

Creating a Collaborative Research Roadmap
Meeting and Webinar

June 26, 2012

A Field Guide

- *Interested in:*
  - Conflict and how to resolve it
  - Implementing strategies for avoiding conflict
  - Understanding what makes great collaborations and teams successful
  - Sharing those elements that contribute to successful participation in and leadership of collaborations and multidisciplinary research teams



teamscience.nih.gov

Reasons to Collaborate

- Access to expertise or particular skills
- Cross-fertilization across disciplines
- Improved access to funding
- Obtaining prestige, visibility or recognition
- Enhancing trainee education
- Learning tacit knowledge about a technique
- Access to equipment or resources
- ….

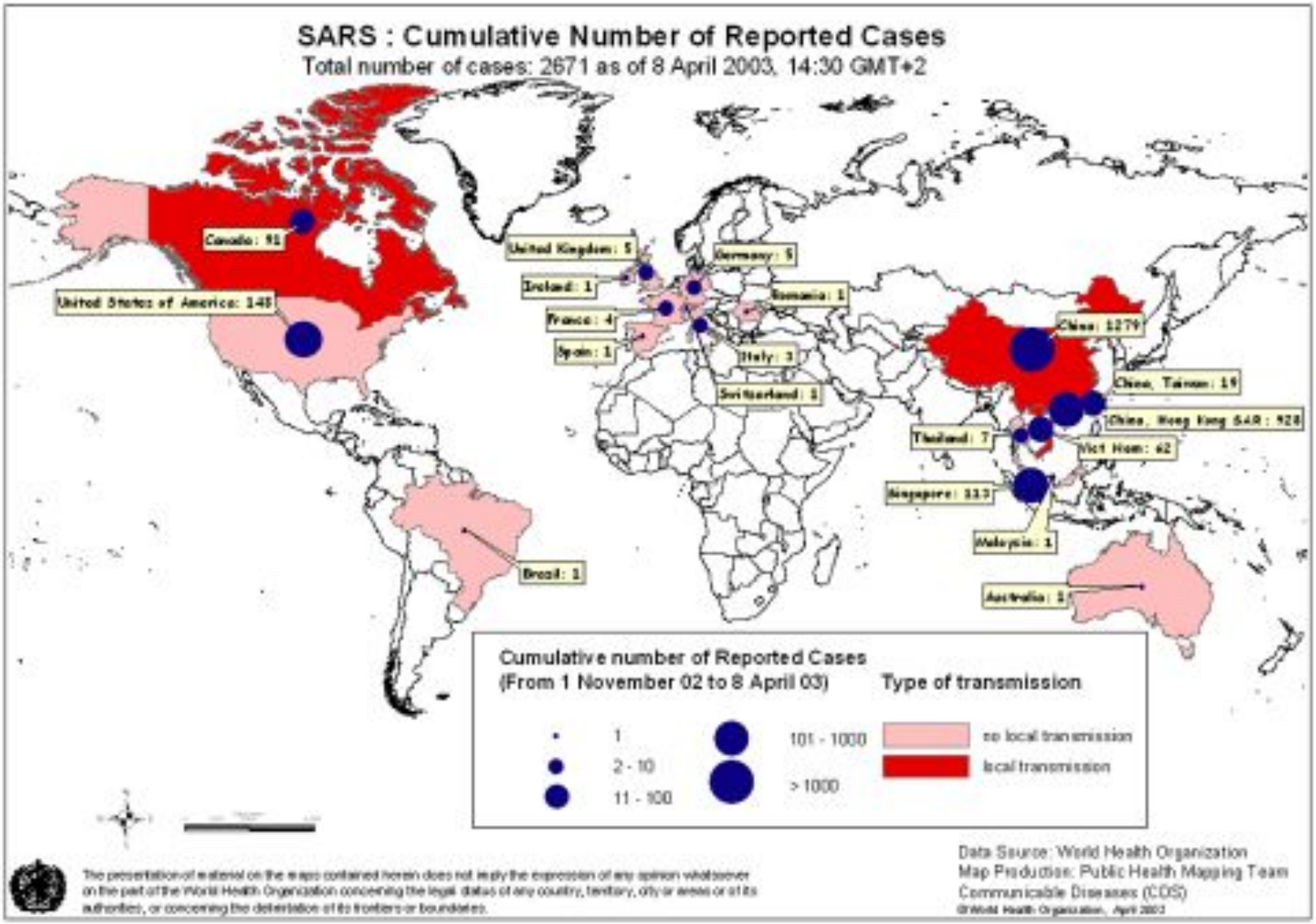
(Gabriele Bammer)

What Problems Lend Themselves to Collaboration?

- Ill-defined problems
- Multiple stakeholders with vested interests
- Disparity of power or resources among stakeholders
- Different levels of expertise/access to needed information
- Complex problems and/or scientific uncertainty
- Differing perspectives on a problem
- Unsuccessful unilateral efforts
- Existing processes are insufficient to address problems

Adapted from: Gray, Barbara. Collaborating: Finding Common Ground for Multiparty Problems. 1989. San Francisco: Jossey-Bass Publishers

Reported SARS Cases: April 2003



Scientific Network

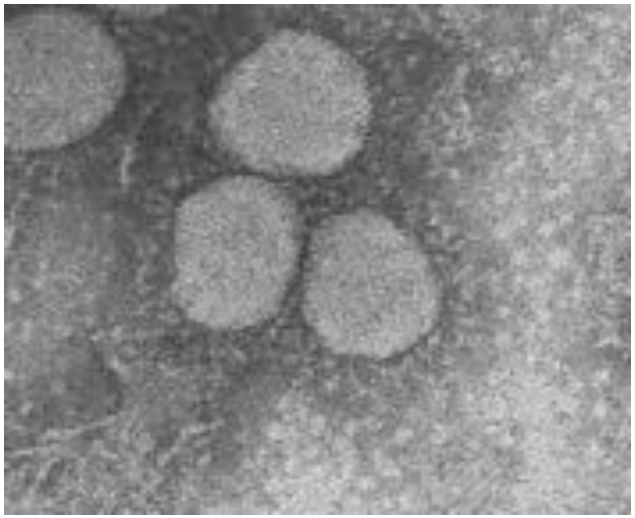
On ***Monday 17 March 2003***, WHO called upon ***11 laboratories in 9 countries*** to join a collaborative multi-center research project on SARS diagnosis. An international multi-center research project to expedite identification of the causative agent was established. The labs that ended up participating are listed below:

- Centres for disease control & Prevention, National Centres for Infectious Diseases,
- Erasmus Universiteit, National Influenza Centre, The Netherlands
- Government Virus Unit , 9/F Public Health Laboratory Centre, China
- Institut für Medizinische Virologie im Klinikum der Johann Wolfgang, Germany
- Institut Pasteur, Head of Unit, Unité de Génétique Moléculaire des Virus Respiratoires National Influenza Center, France
- National Institute of Infectious Diseases Department of Viral Diseases and Vaccine Control, Japan
- National Microbiology Laboratory, Population Pubic Health Branch, Health Canada
- Public Health Laboratory Service, Central Public Health Laboratory, United Kingdom
- University of Hong Kong Faculty of Medicine, China
- Virological Institute, Chinese Center for Disease Control & Prevention, China
- Virology Laboratory, The Chinese University of Hong Kong, China
- Virology Unit, Singapore General Hospital, Singapore
- Guangdong Center for Disease Control & Prevention, China

http://www.geocities.com/avinash_abhyankar/pgzone/sars_main

Identification of the Agent that Causes SARS on April 16, 2003

Newly Identified Coronavirus



Thin section electron micrograph and
negative stained virus particles

Source:
Department of Microbiology, The University of Hong Kong and the Government Virus Unit, Department of Health, Hong Kong SAR China

What is a Scientific Research Team?

…..think of it as a continuum…..

Investigator-initiated research

Investigator works on a scientific problem – largely on his or her own.

Research Collaboration

- Group works on a scientific problem, each bringing some expertise to the problem.
- Each member works on a separate part, which are integrated at the end.
- The interaction of the lead investigators varies from limited to frequent with regard to data sharing or brainstorming.

Integrated Research Team

- Team works on a research problem with each member bringing specific expertise to the table.
- There are regular meetings and discussions of the team's overall goals, objectives of the individuals on the team, data sharing, and next steps.
- One person takes the lead while other members have key leadership roles in achieving the goal.


Process
Power
Trust
The Science
Sharing Credit and Resources
Institutional Support
Funding
Communication

Model of Team Development

Adjourning and Transforming

Forming

Performing

Storming

Norming

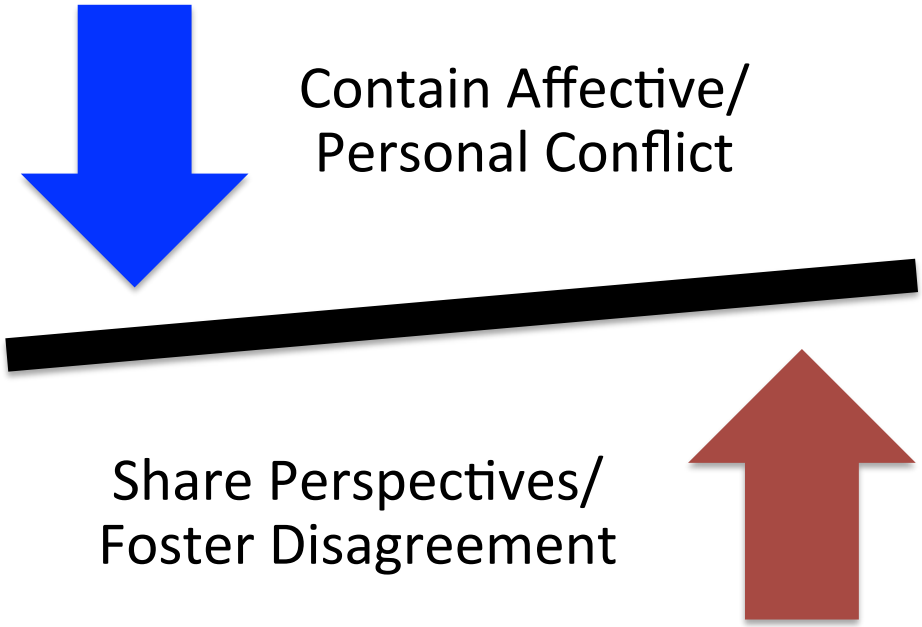
Bruce Tuckman, 1965, 1977

Storming is Important

- Creates a new framework for the team
- Provides source of energy
- Is not “optional” – must occur, so make the most of it
- If you don’t – the team will not mature past a superficial level of interaction

Productive Collision

"A process by which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible."



Barbara Gray, Collaborating: Finding Common Ground for Multiparty Problems, 1989

Managing Diversity: Harnessing Differences

- Essential Differences – disciplinary world-views, methodologies, technologies, criteria for credit and authorship.
  - ✓ Require integration

- Incidental Differences – personality styles, work habits, identity factors – race, gender, etc.
  - ✓ Require effective management but depends on degree of scientific integration

The Value of Diversity

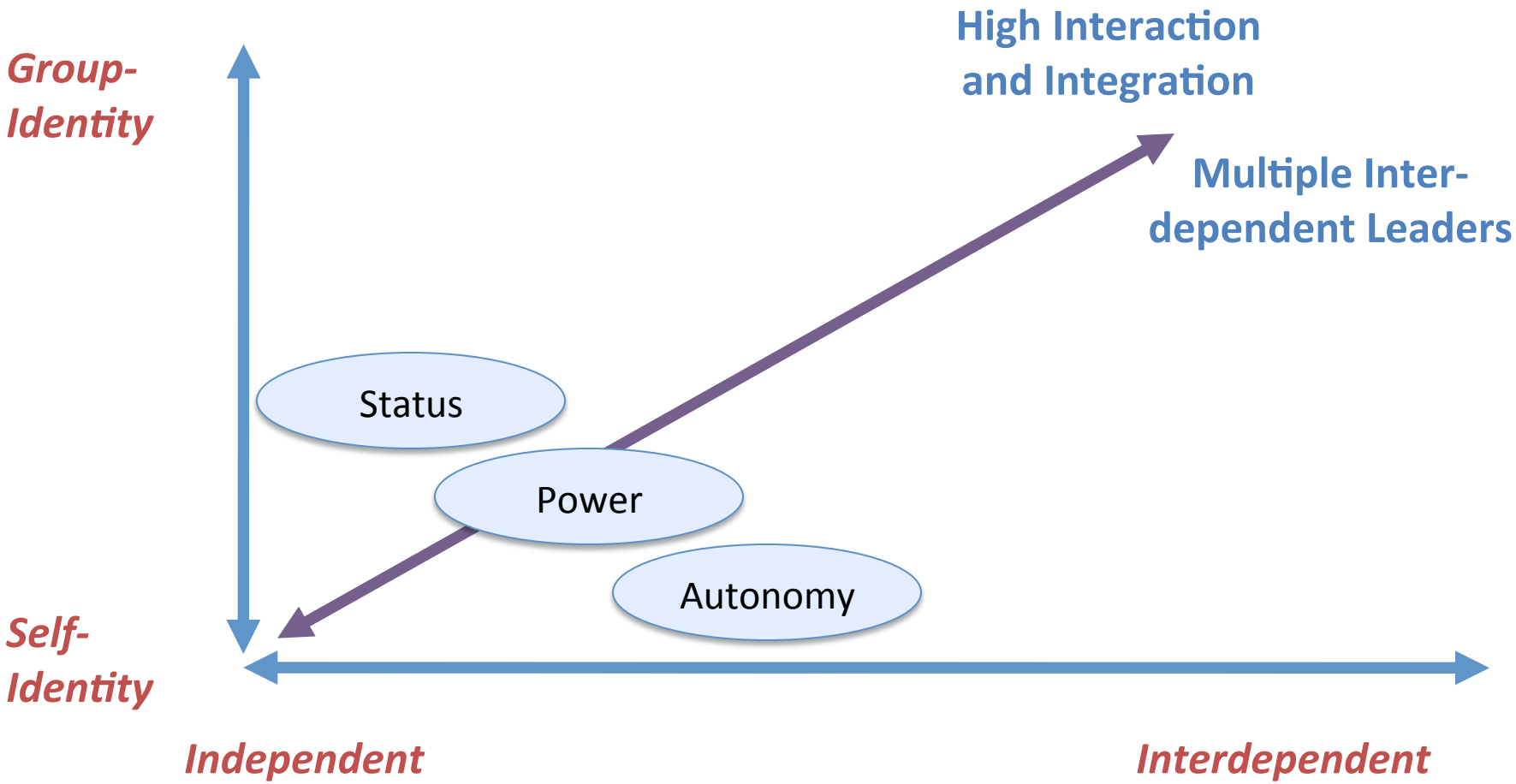
Diversity is an asset when it is assumed that insights, skills, and experiences developed as members of different identity groups are a valuable resource that the workgroup can use to rethink its primary tasks and strategies.

Diversity and a Tech Team

- Technology development is for “everyone”
- If tech teams aren’t diverse, innovation is at risk
- Diverse perspectives are critical
- Consider HP’s recent fiasco with regard to its facial recognition software
- Diversifying tech teams makes stronger products as well as strategies to recruit diverse techies

Facial Recogntion and HP

Collaboration Introduces Threats



Collaboration Requires
Letting Go
- Loss is Risky

Trust Provides Safety
- Building Trust Takes Time

Types of Trust

- *Calculus based trust* – built on calculations of the relative rewards for trusting or losses for not trusting
- *Identity based trust* – built on an assumption of perceived compatibility of values, common goals, emotional/intellectual connection
- *Competence based trust* – built on the confidence in people's skills and abilities, allowing them to make decisions and train others

Trust and the Team

- Trust goes hand-in-hand with your scientific confidence in the results generated by your:
  - Postdoc, Collaborator, Colleagues, etc…
- If trust is never established or damaged once formed…confidence will slip
- The relationship itself drives your perception of other's technical and intellectual abilities

Tools for Establishing Calculus-Based Trust

- "Welcome Letter"
  - Provides a scaffold for building deeper trust including: what you can expect of me, what I expect of you, what to do if we disagree
- Prenuptial (Collaborative) Agreement
  - Jointly created agreement among collaborators: can be formal or informal in its creation
- Mac Truck Lists
  - Roles and responsibilities of every team member are clearly articulated, listed and shared with every other member of the team

Prenuptials for Scientists: Collaborative Research Agreements

Categories to cover

- Goals and Vision of the Collaboration
  - Including…when is the project/collaboration "over"?
- Who Will Do What?
  - Expectations, responsibility and accountability
- Authorship, Credit
  - Criteria, attribution, public comment, media, IP
- Contingencies and Communicating
  - What if …? and Rules of engagement
- Conflict of Interest
  - How will you ID conflicts? And resolve them?

Template available at: teamscience.nih.gov

Vision

Vision impacts organizational performance, shapes people's views of leadership, and improves group effectiveness. Vision is a key to successful leadership, and is central to strategic planning. It creates the spark that lifts organizations beyond the mundane.

O'Connell et al. Group and Organization Management 36: 102 (2011)

Developing a Shared Vision

- Everyone can describe the "big picture"
- Each team member can state his/her research goal and how it relates to the "bigger picture"
- Have the group discuss each member's accomplishments and challenges in achieving the goal – and how they relate to the overall mission
- Instill ownership of roles and responsibility for attaining goals
- Team accepts responsibility and accountability for both accomplishments and failures – without blaming.

Elevator Speech

- You are in the elevator with a member of your institution's leadership who just acquired a 1M gift from a donor. She is looking for projects to fund and she asks you to explain the value of your project and the expected outcome.

- **What do you say?**

(you have 30 seconds)

Leaders Set Clear Expectations

Provides a scaffold for building deeper trust

There are no secrets or surprises and there is a strong platform for discussion

- Communication
- Regular Meetings with Clear Agendas
- Authorship
- Conduct of Investigation, Research…
- Technical Support
- Career Development
- Evaluation Criteria, etc.…

Tools for Setting Expectations

- "Welcome Letter"
  - Provides a scaffold for building deeper trust including: what you can expect of me, what I expect of you, what to do if we disagree
- Prenuptial (Collaborative) Agreement
  - Jointly created agreement among collaborators: can be formal or informal in its creation
- Mack Truck Lists
  - Roles and responsibilities of every team member are clearly articulated, listed and shared with every other member of the team

Still, no matter what type of collaboration…

Collaborative partners face difficulties:

- Poor listening and new language
- Conflicts over goals and methods to achieve them
- Squabbles about validity of conceptual frameworks
- Competition for influence, power, recognition, …
- Threat to ego and/or status
- Inability to integrate diverse perspectives
- Institutional disincentives—stress disciplinary competence vs. out-of-box thinking
- Difficulty finding funding and publication outlets

Trust
Membership (Building a Team)
Shared Vision
Getting and Sharing Credit
Conflict Resolution
Adversarial Collaboration
Communication and Negotiation
Team Dynamics
Team Networks and Surrounding Systems
Challenges to the Success of Scientific Teams
Fun !!!!!!!!!!!!
Leadership

Arc
/

Sharing Credit

- Howard Gadlin
  - NIH Ombudsman
- Samantha Levine-Finley
  - Associate Ombudsman, NIH OD

L. Michelle Bennett
LMBennett@NIH.GOV

teamscience.nih.gov